

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 91-3-E - ORDER NO. 91-636
AUGUST 6, 1991

IN RE: Adjustment of Base Rates for Fuel) ORDER APPROVING
Costs for Carolina Power and) BASE RATES FOR
Light Company.) FUEL COSTS

On March 20, 1991, the Public Service Commission of South Carolina (the Commission) commenced a public hearing on the issue of the recovery of the cost of fuel used in electric generation by Carolina Power and Light Company (CP&L or the Company) to provide service to its South Carolina retail electric customers. As it was not possible to complete the hearing on March 20, 1991, the hearing was continued on April 4, 1991.

The procedure followed by the Commission, as set forth in S.C. Code Ann. §58-27-865 (Supp. 1990), provides for a six month review of an electric utility's fuel costs. The review in this case is from October 1990 through March 1991. Based on a consensus of the parties, the Commission, by Order No. 91-232, approved a fuel factor of 1.475 cents per kilowatt-hour, effective April 1, 1991, until further Order of the Commission.

At the hearings held on March 20 and April 4, 1991, William F. Austin, Esquire, Robert W. Kaylor, Esquire, and Adrian N. Wilson, Esquire, represented the Company; Francis P. Mood, Esquire,

Elizabeth Taylor, Esquire, and Garrett A. Stone, Esquire, represented the Intervenor Nucor Steel, a Division of Nucor Corporation (Nucor); Nancy J. Vaughn, Esquire, represented the Intervenor the Consumer Advocate for the State of South Carolina (the Consumer Advocate); and Gayle B. Nichols, Staff Counsel, and F. David Butler, Staff Counsel, represented the Commission Staff. The record before the Commission consists of the testimony of four witnesses on behalf of the Company, one witness on behalf of Nucor, two witnesses on behalf of the Commission Staff (Staff), and 17 exhibits.¹

Based upon a thorough consideration of the evidence in the record and the applicable law, the Commission makes the following findings of fact and conclusions of law.

FINDINGS OF FACT

1. The record of this proceeding indicates that for the period from August 1990 through January 1991, the Company's actual total fuel costs for its electric operations amounted to \$292,670,760.² This figure was uncontroverted.

1. At the beginning of the hearing, Staff Counsel noted that the parties had stipulated that testimony relating to outages dated August 16, 1990, September 27, 1990, and October 12, 1990, at Brunswick Unit 2 would not be considered until the September 1991 hearing.

2. Because information concerning outages during the period under review in the hearing is not available until approximately two months after the hearing, the Commission considers the information from the two months prior to the hearing period and the following four months.

2. Staff witness A. R. Watts reviewed and compiled a percentage generation mix statistical sheet for the Company's fossil, nuclear, and hydroelectric plants for August 1990 through January 1991. The fossil generation ranged from a high of 77% in November 1990 to a low of 55% in August 1990. The nuclear generation ranged from a high of 44% in August 1990 to a low of 21% in November 1990. The percentage of generation by hydro ranged from 1% to 4% for this period.

3. Staff witness Watts considered the fossil unit outage report submitted by the Company and found no problem areas. The equivalent availability of the Company's fossil system was approximately 85% during the period from August 1990 through January 1991.

4. The Company's nuclear system operated at a capacity factor of 52.13% for the six month period and provided 7.1 billion kilowatt hours of generation. Per Company witness Coats, this represented 36% of the Company's generation for the period. During the period, Brunswick Unit 1 achieved a capacity factor of 25.6%, Brunswick Unit 2 achieved a capacity factor of 74.8%, Harris Unit 1 achieved a capacity factor of 80.6%, and Robinson Unit 2 achieved a capacity factor of 19.8%.³

3. Brunswick Unit 1 and Robinson 2 were out of service for a large portion of the period for scheduled refueling and other maintenance outages.

5. During the period from August 1990 through January 1991 coal suppliers delivered 4,368,126.28 tons of coal at a weighted average received cost per ton of \$45.68. The Staff's audit of the Company's actual fuel procurement activities by Staff witness Jacqueline Cherry demonstrated that the average monthly received cost per ton varied from \$41.13 in December 1990 to \$48.69 in November 1990.

6. Company witness Larry L. Yarger testified that the Company's fuel procurement practices and procedures were reasonable. The Staff conducted an extensive review and audit of the Company's fuel purchasing practices and procedures for the subject period. The Staff's accounting witness, Jacqueline R. Cherry, testified that the Company's fuel costs were supported by the Company's books and records.

7. The record of this proceeding indicates that a comparison of the Company's fuel revenues and expenses for the period August 1990 through January 1991 produces an under-recovery of \$831,929. After taking into consideration a projected over-recovery of \$1,800,546 for the months of February 1991 and March 1991, the cumulative over-recovery is \$968,617.

8. The Company's projections of its fuel costs and system sales during the time period April 1991 through September 1991 as presented by Company witness Dale M. Bouldin were not challenged. These projections yield an average cost per kilowatt hour of 1.536 cents. Subtracting from this the expected over-recovery as of the end of March 1991, and divided by the projected South Carolina

retail kilowatt hour sales during this same period, produces a base fuel component of 1.502 cents. However, witness Bouldin testified that, based upon the Company's desire for rate stability and its projections of its fuel costs for the succeeding six months (October 1991 - March 1992), the Company recommended a base fuel component of 1.475 cents. Although Staff witness Watts estimated the average fuel expense to be 1.500 cents per kilowatt-hour, he also recommended that the base fuel component be set at 1.475 cents per kilowatt hour for the six month period of April 1991 through September 1991. Neither Nucor nor the Consumer Advocate recommended a fuel factor component.

9. The only fuel related costs which have been challenged as unreasonable in this proceeding relate to the service outages experienced at the Brunswick Unit No. 2 Nuclear Plant on August 19, 1990, and January 25, 1991. Therefore, the Commission concludes that all other fuel costs incurred by the Company are reasonable and should be recovered by CP&L. The Commission, however, finds that it must consider the August 9, 1990, and January 25, 1991, outages in depth. The Commission notes that the parties do not disagree on the facts of the contested outages.

A. The August 19, 1990, Outage

The August 19, 1990, outage occurred when an Instrumentation and Control (I&C) technician failed to follow procedures while performing a maintenance surveillance test on four high condenser pressure instrument channels. This technician failed to insure that one of the channels was properly reset after it was tested.

Additionally, he conducted the test without the presence of a second technician as was required by CP&L's procedures.

Established procedure at Brunswick required that the control room operator watch the control board in the control room during the maintenance surveillance test and communicate with the I&C technician performing the test. Procedure further required that the control room operator respond, in accordance with annunciator procedures, to an annunciator alarm on the control board unless the alarm was from a known cause.

During the August 19, 1990, test the control room operator knew that the maintenance surveillance test was in progress; the I&C technician had given him a list of annunciator alarms he would be seeing on the control board. When an alarm occurred that was inconsistent with the control room operator's expectation, the operator went around the control room board and asked the I&C technician to discuss the status of the testing. The I&C technician assured the operator that the alarm was due to the testing.⁴ By the time the control room operator returned to the control room, the reactor had scrammed and Brunswick Unit 2 went into a forced outage.

Thereafter, the I&C technician signed a document which stated certain procedural tests had been completed even though they hadn't been performed. Additionally, although he had conducted the test alone, the I&C technician convinced a second technician to sign a

4. The maintenance surveillance test is conducted on channels located immediately behind the control room board.

report stating that he had been present during the test and that he had independently verified each of the steps of the test as they were performed. CP&L took disciplinary action against the personnel involved in the cause of the outage and terminated the two I&C technicians.

The Nuclear Regulatory Commission (NRC) sent an Augmented Inspection Team to Brunswick to investigate the outage. During CP&L's and the Inspection Team's joint investigation, it was determined that the plant should not be brought back on line until repair and maintenance work on certain equipment was completed. The Augmented Inspection Team concluded that the August 19 reactor scram was "the result of an intentional failure to follow procedures exacerbated by a lack of command and control by operations personnel." Hearing Exhibit 6.

The NRC assessed CP&L with a Severity Level III violation.⁵
The NRC's Notice of Violation stated that as follows:

The seriousness of this event cannot be overstated. A significant series of inappropriate actions on the part of the technician performing the test resulted in an unnecessary challenge to plant safety systems and related equipment. In addition, this individual influenced the actions of another individual, such that the second technician knowingly falsified the maintenance surveillance test. Although an unintentional failure to follow procedures or the inadvertent creation of an inaccurate document might normally be categorized at Severity Level IV, the severity level in this case is being adjusted because of the willful aspects of this event. Specifically, the first technician knowingly failed to follow the procedure, with respect to the requirement for independent verification, and the second

5. The NRC has a series of violations ranging from Severity Level I to Severity Level V. Severity Level I is the most severe violation.

technician knowingly falsified the maintenance surveillance test procedure, with respect to those steps indicating independent verification. Therefore, this violation has been categorized at Severity Level III.

Hearing Exhibit No. 14.

The NRC credited CP&L for its "prompt and extensive corrective action, that included the termination...at B.S.E.P. [Brunswick Steam Electric Plant] for the two technicians involved in the event, and the initiation of appropriate actions to inform and train....Staff on the importance of strict adherence to procedures and work control." Hearing Exhibit 14. Accordingly, the NRC did not assess CP&L with a civil penalty. Nucor witness Samuel H. Hobbs, Jr. explained that the NRC chose to forgo assessing a civil penalty "to provide an incentive for self-identification of problems." (TR. Vol. 1, p. 128). Brunswick Unit 2 was ultimately down for 351 hours.

CP&L rebuttal witness Russell B. Starkey testified that the Company had special crews assigned to perform maintenance surveillance tests and that these crews were formed by the personnel most qualified for the work. He testified that CP&L's crews had performed over 200 maintenance surveillance tests per month and that each test consisted of hundreds of steps which, if not performed exactly, could cause automatic shutdown of the reactor. Starkey testified that the August 19, 1990, outage was the first caused by improper performance of a maintenance surveillance test in over six years.

Company witness Starkey further testified that each of the I&C

technicians involved in the August 19th outage were fully trained and qualified. Starkey testified that the technicians had a two-year A.A.S. Degree or the equivalent experience. He testified that the technicians had been through the Company's formal Craft and Development Program for training. He stated that both of the technicians had five years' experience at the plant and had passed recertification requirements several months before the outage.⁶

Witnesses for the Company, Staff, and Nucor agreed that the conduct of the technicians who caused the August 19 outage was unreasonable. CP&L witness Starkey characterized the two technicians' actions in failing to follow procedures and covering-up that failure as "overconfiden[t]" leading "to gross negligence." (Tr. Vol. 4, p. 71, line 5-p. 172, line 21). Starkey testified the I&C technician's actions constituted gross negligence because one technician started conducting the procedure when he knew a second technician needed to be present. As Starkey noted, "this was a guy willfully and deliberately out there with a procedure in his hand racing through it." (Vol. 4, p. 74, lines 12-14).

Staff witness Watts and Nucor witness Hobbs also testified that the conduct of the control room operator was unreasonable. Watts testified the control room operator had an opportunity to

6. The Commission notes that on the second day of the hearing, Nucor moved to strike certain rebuttal testimony of Company witness Starkey which concerned the equipment failures after the August 19th outage and was alleged not to have been included in the witness' pre-filed rebuttal testimony. (TR. Vol. 4, p. 91, line 19-p.92, line 11). The Commission overrules the motion on the ground that much of Starkey's pre-filed rebuttal testimony addressed the equipment failures after the August 19th outage.

review the actual procedure sheet and catch the problem before an outage ensued and that his failure to do so contributed to the outage. Hobbs testified the control room operator knew that lights were going to come on which meant that the systems might be out of service and that when he saw the lights come on that were not the ones he expected, he should have investigated further. Watts testified that the control operator could have prevented the scram by pursuing the technician's explanation of the alarm more vigorously.

B. The January 25, 1991, Outage

On January 25, 1991, Brunswick Unit 2 experienced an automatic shutdown during the calibration of a feedwater computer point. Personnel conducting the calibration relied on a summary sheet even though the summary sheet stated that it was not to be used as a substitute for "Prerequisites and Precautions." Moreover, the summary sheet indicated that there were no required plant conditions for the calibration when actually the plant was supposed to be either in cold shutdown or in refueling. Apparently, by relying on the summary sheet, the shift foreman, the work control group, the senior control room operator, and at least two senior reactor operators approved that the calibration be done while the plant was operating, instead of checking and following the full procedure. Staff witness Watts testified that for the same procedure at Brunswick Unit 1, the summary sheet specified that the plant had to be in a refueling outage in order to be conducted. Company witness Coats admitted that CP&L management was responsible

for the summary sheets.

During this outage, CP&L experienced problems restarting the recirculation pump motor generator sets which had tripped when the outage occurred and would not restart. The drive motor temperature switch was replaced before the plant could be brought back on line. Brunswick Unit 2 was returned to service in 153 hours. The Company did not present any evidence that a scheduled outage would have been necessary as a result of the failed drive motor temperature switch.

The NRC conducted an inspection of the January 25th outage and proposed a \$50,000 civil penalty⁷ for the Severity Level III violation. In proposing this fine, the NRC stated that "[t]he root cause of the violation was poor work control." Hearing Exhibit 17. The NRC noted that "there existed opportunities for at least four responsible reviewers to prevent this work from being inappropriately performed." Hearing Exhibit 17.

Witnesses for Nucor and the Staff testified that the employee conduct causing the January 25, 1991, outage was negligent and unreasonable.

10. CP&L's witnesses testified that the Commission should not disallow any of the excess fuel expenses associated with either the August 19th or January 25th outages. CP&L witnesses explained that both outages were caused by employees who failed to follow well-established Company procedures.

7. If the NRC proposes a penalty, the Company has thirty (30) days to protest the proposed penalty.

11. Staff witness Watts testified that it was his recommendation that the Commission disallow recovery of fuel costs for 30 hours of the August 19th outage and for 30 hours of the January 25th outage. Watts testified that, under ideal conditions and without equipment failures, he estimated a nuclear plant could be brought on line within 30 hours after a forced outage. Watts testified that, in his opinion, the Company's shareholders should not have to incur the expenses associated with the equipment malfunctions after the initial outages.

12. Nucor witness Hobbs testified that the Commission should disallow any fuel recovery for the full extent of the August 19th and January 25th outages. He testified that the outages were caused by unreasonable and imprudent actions on the part of the Company and that CP&L should not recover any fuel replacement costs incurred during the full extent of either outage. In its brief, the Consumer Advocate concurred with Nucor's position.

CONCLUSIONS OF LAW

1. Pursuant to S.C. Code Ann., §58-27-865(A)(Supp. 1990), each electric utility must submit to the Commission its estimated fuel costs for the next six months. Following an investigation of these estimates and after a public hearing, the Commission directs each electric utility to place in effect in its base rate an amount designed to recover, during the next six months, the fuel costs determined by the Commission to be appropriate for that period, adjusted for the over-recovery or under-recovery from the preceding six month period.

2. South Carolina Code Ann. §58-27-865(F) requires the Commission to allow electric utilities to recover "all of their prudently incurred fuel costs...in a manner that tends to assure public confidence and minimize abrupt changes in charges to consumers."

3. South Carolina Code Ann. §58-25-865(E)(Supp. 1990) specifies as follows:

The Commission shall disallow recovery of any fuel costs that it finds without just cause to be the result of failure of the utility to make every reasonable effort to minimize fuel costs or any decision of the utility resulting in unreasonable fuel costs, giving due regard to reliability of service, economical generation mix, generating experience of comparable facilities, and minimization of the total cost of providing service.

4. As stated by our Supreme Court in Hamm v. South Carolina Public Service Commission, 291 S.C. 178, 352 S.E.2d 476, 478 (1987), Section 58-27-865(E) requires the Commission "to evaluate the conduct of the utility in making the decisions which resulted in the higher fuel costs. If the utility has acted unreasonably, and higher fuel costs are incurred as a result, the utility should not be permitted to pass along the higher fuel costs to its customers." "[T]he rule does not require the utility to show that its conduct was free from human error; rather it must show it took reasonable steps to safeguard against error." Id. at 478, citing Virginia Electric & Power Co. v. Division of Consumer Counsel, 220 Va. 930, 265 S.E.2d 697 (1980). Accordingly, where there was no evidence that a utility had made any effort to insure that work

done by an outside contractor complied with NRC standards and, consequently, higher fuel costs were incurred, the South Carolina Supreme Court disallowed recovery of the excess fuel costs. Similarly, the Supreme Court of Virginia disallowed recovery of excess fuel costs where the utility failed to provide any checks on the work of a tape and strip chart interpreter who worked long hours and whose work was critical of plant operations. The Virginia Supreme Court found that the utility's failure to provide safeguards was imprudent. Id.

5. The major advantage of producing electricity by nuclear power is the relatively low fuel cost for nuclear fueled generating facilities. The cost of generation of electricity is generally composed of costs such as capital, interest, taxes, insurance, operating and maintenance (O&M) costs, and fuel costs. For fossil fueled plants, the cost of the fuel is a large portion of the total cost to generate electricity. For nuclear power plants, while the capital and O&M costs are higher compared to fossil fueled plants, the fuel costs are comparatively low. Thus, if the electricity generated by a nuclear plant must be replaced by electricity generated by a coal or gas fired plant, the Company incurs higher fuel costs. This difference between the fuel cost to generate a quantity of electricity by fossil fuel and the fuel cost to generate the electricity by nuclear fuel is the excess replacement fuel cost.

6. The prudence of CP&L's fuel purchasing practices and procedures for the subject period were not challenged during this proceeding. Therefore, the Commission concludes that CP&L's fuel procurement practices were reasonable.

7. In keeping with the spirit of Section 58-27-865(F)(Supp. 1990) to allow utilities to recover prudently incurred fuel costs, assure public confidence, and minimize abrupt changes in consumer charges, the Commission approves a base fuel component of 1.475 cents per kilowatt hour. This factor will continue the factor adopted in Order No. 91-232.

8. The Commission has carefully reviewed the language of §58-27-865(E) and the Supreme Court's explanation of the statute in Hamm, supra. The Commission notes that, pursuant to Hamm, a utility is not required to establish that its conduct is free from human error; instead, the utility "must show it took reasonable steps to safeguard against error." Id. at 478. The Commission concludes that, on the basis of this language, where a utility has effective and enforceable procedures and policies which sufficiently safeguard against human error, this Commission shall allow the utility to recover excess replacement fuel costs which occur because of human error and in spite of the safeguards. The Commission finds that this policy encourages utilities to implement procedures to prevent human error and to discipline employees who fail to comply with the established procedures.

9. The Commission finds that CP&L should be allowed to recover the excess fuel costs associated with the August 19 outage. While the Commission finds that the I&C technician's action in performing the maintenance surveillance test alone and later obtaining the signature of another I&C technician verifying he had observed the test was unreasonable, the Commission concludes that CP&L had sufficient procedures in place to prevent an outage from occurring during a maintenance surveillance test. CP&L's procedures required two experienced I&C technicians to be present during the test and for one of the technicians to verify that each of the steps of the test was properly performed; CP&L had no reason to doubt the ability or honesty of the I&C technician who conducted the August 19 maintenance surveillance test; CP&L procedures required the control room operator and I&C technicians to remain in contact during the test. Although the control room operator may have erred by not making further inquiry into the cause of the annunciator signals and may have ultimately contributed to the outage by not having known the meaning of the annunciator signal, the Commission concludes that his actions were not the sort envisioned in Hamm as grounds to support disallowance of fuel replacement costs. Moreover, the Commission concludes that no utility's procedures could prevent an experienced technician from deliberately violating company policies, rushing through test procedures, and consequently, causing an outage. Finally, as stated by the NRC and recognized by witness Hobbs, allowing a utility to recover excess fuel replacement costs, even though an

employee knowingly and intentionally violates procedure, encourages the Company to identify potential personnel problems and to heighten procedures in order to prevent unscheduled outages.

10. The Commission concludes that CP&L should not be allowed to recover the excess fuel replacement costs associated with the January 25th outage. The Commission finds that CP&L management admitted responsibility for the critical error in the summary sheet which caused the forced outage. CP&L management should have recognized the error on the summary sheet, particularly in light of the fact that Brunswick Unit No. 1's summary sheet accurately reflected requisite plant conditions. CP&L presented no evidence indicating that it took any steps, much less made reasonable effort, to prevent inaccurate summary sheets from being used by plant employees.

Further, the Commission concludes Section 58-27-865(E) compels it to disallow recovery of the excess replacement costs incurred during the full length of the January 25th outage. Clearly, use of the incorrect summary sheet ultimately resulted in Unit 2 being down for 153 hours. Arguably, without unexpected equipment failures the plant could have been brought back on line within 30 hours. However, in this case, the recirculation pump motor generator sets were tripped as a result of the outage. Replacement of the drive motor temperature switch was the direct result of the scram. Because a negligent person is responsible for all natural and probable consequences of his negligent action, the Commission disallows the recovery of excess fuel replacement costs for 153

hours. See, Greenville Memorial Auditorium v. Martin, ___ S.C. ___,
391 S.E.2d 546 (1990).

IT IS THEREFORE ORDERED THAT:

1. The base fuel factor for the period April 1991 through September 1991 is set at 1.475 cents per kilowatt-hour.

2. Within ten (10) days of the date of this Order, CP&L shall file with the Commission for its approval, rate schedules designed to incorporate the findings herein and an adjustment for fuel costs as demonstrated by Appendix A.

3. The allowable fuel expense for the period August 1990 through March 1991 shall be reduced by \$168,257⁸ because of the unreasonable actions of the Company for the January 25, 1991, outage.

8. This figure results in a positive adjustment to the South Carolina Retail Cumulative Recovery Account. The adjustment is a calculation of the length of the January 25th outage, multiplied by a capacity factor of 85% which was approved by the Commission in Order No. 90-961 (Oct. 18, 1990), in Docket No. 90-4-E, adjusted for Power Agency Ownership, and multiplied by the cost difference between Brunswick Unit No. 2's fuel and average fossil fuel for the month of the outage. Thereafter, the South Carolina retail energy allocation factor was applied.

4. CP&L shall fully respond to discovery from all parties and from the Commission Staff in an open and expeditious manner in all proceedings before this Commission.

BY ORDER OF THE COMMISSION:


Chairman

ATTEST:


Executive Director

(SEAL)

Carolina Power and Light
Adjustment for Fuel Costs

APPLICABILITY

This adjustment is applicable to and is a part of the Utility's South Carolina retail electric rate schedules.

The Public Service Commission has determined that the costs of fuel in an amount to the nearest one-thousandth of a cent, as determined by the following formula, will be included in the base rates to the extent determined reasonable and proper by the Commission for the succeeding six months or shorter period:

$$F = \frac{E}{S} + \frac{G}{S_1}$$

Where:

F = Fuel cost per kilowatt-hour included in base rate, rounded to the nearest one-thousandth of a cent.

E = Total projected system fuel costs:

- (A) Fuel consumed in the Utility's own plants and the Utility's share of fuel consumed in jointly owned or leased plants. The cost of fossil fuel shall include no items other than those listed in Account 151 of the Commission's Uniform System of Accounts for Public Utilities and Licensees. The cost of nuclear fuel shall be that as shown in Account 518 excluding rental payments on leased nuclear fuel and except that, if Account 518 also contains any expense for fossil fuel which has already been included in the cost of fossil fuel, it shall be deducted from this account.

Plus

- (B) Purchased power fuel costs such as those incurred in unit power and Limited Term power purchases where the fuel costs associated with energy purchased are identifiable and are identified in the billing statement.

Plus

- (C) Interchange power fuel costs such as Short Term, Economy, and other where the energy is purchased on economic dispatch basis.

Energy receipts that do not involve money payments such as Diversity energy and payback of storage energy are not defined as purchased or interchange power relative to this fuel calculation.

Minus

- (D) The cost of fuel recovered through intersystem sales including the fuel costs related to economy energy sales and other energy sold on an economic dispatch basis.

Energy deliveries that do not involve billing transactions such as Diversity energy and payback of storage are not defined as sales relative to this fuel calculation.

S = Projected system kilowatt-hour sales excluding any intersystem sales.

G = Cumulative difference between jurisdictional fuel revenues billed and fuel expenses at the end of the month preceding the projected period utilized in E and S.

S₁ = Projected jurisdictional kilowatt-hour sales for the period covered by the fuel costs included in E.

The appropriate revenue related tax factor is to be included in these calculations.

The fuel costs (F) as determined by South Carolina Public Service Commission's Order No. 91-636 for the period April 1991 through September 1991 is 1.475 cents per kilowatt-hour.